



U.S. Patent Application Number: LW2003/01

## A Method of Producing Gold Nanoparticles

Inventors: Hsing Kuang Lin and Daniel Edward Walsh

### DISCUSSION OF BACKGROUND ART

*Substrate spec  
Oil to enter  
Cu  
3/6/04*

Gold has been used for connectors in electronic computational devices due to its good electrical and thermal conductivities. Its excellent oxidation resistance in most environments is also a key property, and another reason why the electronic computational industry selects gold as a conductor. As electronic devices are driven smaller and smaller, gold's properties become even more important. Consequently, gold nanoparticles could become one of the key elements in manufacturing nano-scale devices. Currently, gold nanoparticles have also been used as tags in biological research.

Several approaches have been made to generate gold nanoparticles. Gold nanoparticles were generated by reduction of gold complex ions in gold salt solution with NaBH<sub>4</sub>, in the presence of dendrimers (Esumi et al., 2000; Grohn et al., 2001) or with sugar balls (Esumi et al., 2000). Ultraviolet irradiation of Langmuir-Blodgett films of octadecylamine, 4-hexadecylaniline and benzylidimethylstearylammomium chloride monohydrate deposited from aqueous HAuCl<sub>4</sub> subphases was tested to generate gold nanoparticles. (Ravaine et al., 1998). Cai et al. (1998) investigated the generation of gold nanoparticles by laser ablation of gold microparticles. These approaches are expensive and often involve pollution-generating processes.

### SUMMARY OF THE INVENTION

The present invention is directed to a method for producing gold nanoparticles. Silver and platinum group metal nanoparticles can also be generated by the present invention. Platinum group metals include ruthenium, rhodium, palladium, osmium, iridium and platinum.